

Lower Upper Miocene Fan 1 Play

UM1 F1, #1381

Discorbis 12

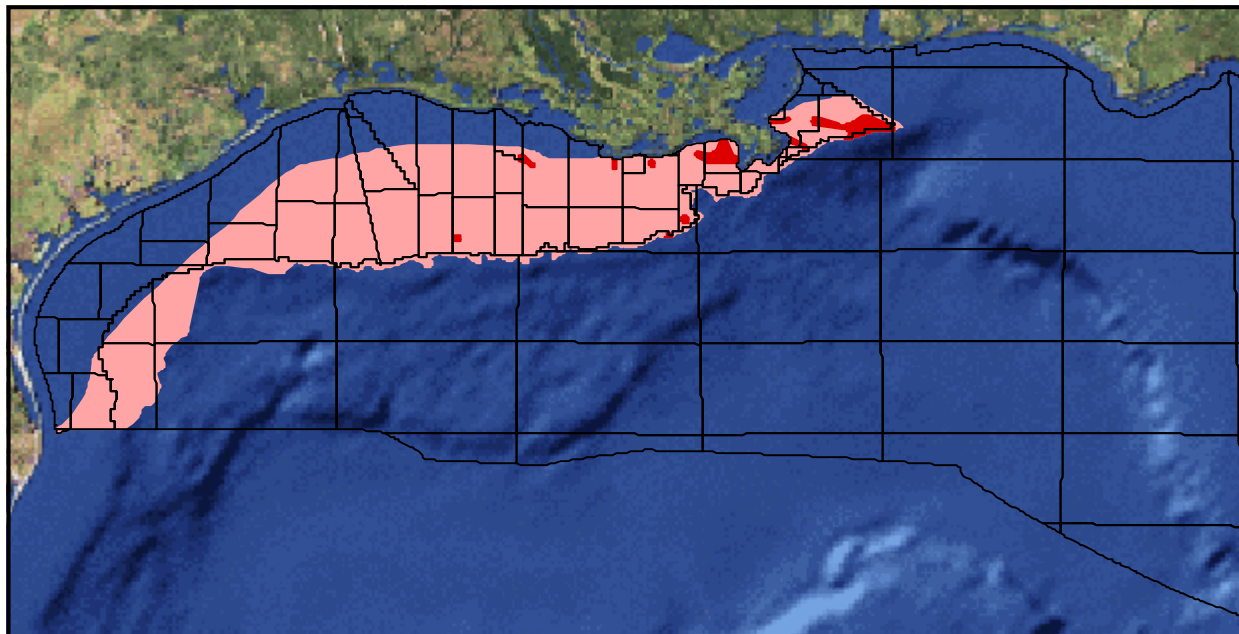


Figure 236. UM1 F1 map showing location of play. Play limit shown in light red; hydrocarbon limit shown in dark red.

Overview

The Lower Upper Miocene Fan 1 Play (UM1 F1) contains reserves of 992.422 Bcfg and 50.388 MMbo (226.976 MMBOE) in 77 sands in 23 fields. The play extends continuously from the South Padre Island to Destin Dome Area ([Figure 236](#)).

Description

UM1 F1 is defined by (1) a deep-sea fan depositional style representing sediments deposited basinward of the UM1 shelf edge, (2) an extensional structural regime with salt-withdrawal basins and extensive listric, growth faulting rooting into salt detachments on the modern GOM shelf, and (3) the UM1 Chronozone, the top of which is defined by the *Discorbis 12* biozone ([Figure 8](#)).

UM1 F1 extends continuously from the South Padre Island Area offshore Texas, along and updip from the modern GOM shelf edge to the west-central Destin Dome Area east of the modern Mississippi River Delta ([Figure 236](#)). Hydrocarbons have been found in discontinuous clusters from the Vermilion to Main Pass Area. In the offshore Louisiana

area, there is a gap in hydrocarbon discoveries across the southern regions of the West Cameron through Grand Isle Areas. This gap represents an area where numerous, allochthonous salt bodies interrupt the deltaic sedimentary section and outlines an area of potential UM1 subsalt discoveries.

Little change in depositional systems from upper middle Miocene (MM9) time to UM1 occurred. The South Brazos Delta System (Morton et al., 1985) dominated deposition to offshore Texas, and the ancestral Mississippi River Delta System to offshore Louisiana. However, there are no hydrocarbon discoveries offshore Texas presumably because sediment influx to the offshore Texas area during UM1 time was minor because major depocenters were located offshore of southeastern Louisiana (Curtis, 1970).

No significant lateral shift occurs from MM9 deep-sea fan deposits to those of UM1 time. However, the shelf edge west of the north-central Ship Shoal Area shows a basinward shift from MM9 to UM1 time, indicative of the prograding nature of the ancient delta systems.

Play Limits

UM1 F1 extends onshore in an updip direction, except from the South Padre Island to Ship Shoal Area. Here, the play is limited by the shelf edge associated with the *Discorbis* 12 biozone and grades into the sediments of the Lower Upper Miocene Progradational Play (UM1 P1). To the northeast, UM1 F1 is limited by the deposits of the Lower Upper Miocene Aggradational/Progradational Play (UM1 AP1) overlying the lower Cretaceous carbonate shelf. To the southwest, UM1 F1 extends into Mexican national waters. Downdip, UM1 F1 is limited by the Lower Upper Miocene Fan 2 Play (UM1 F2).

Depositional Style

UM1 F1 is characterized by deep-sea fan systems deposited basinward of the UM1 shelf edge. Component facies include channel/levee complexes, sheet-sand lobes, interlobe/fringe sediments, and slump sediments that were deposited on the UM1 upper and lower slope, in topographically low areas between salt structure highs, and abyssal plain. These deep-sea fan systems are often overlain by thick shale intervals representative of zones of sand bypass on the shelf, or sand-poor zones on the slope.

The UM1 deep-sea fan interval varies from less than 50 to more than 5,000 ft in thickness, with net sand thicknesses as much as approximately 1,400 ft. Individual sands range from a few tens of feet to approximately 100 ft in thickness. Sand-dominated successions comprising deposits of multiple sheet-sand lobes can be more than 1,000 ft thick, with intervening shale sequences reaching as much as several thousands of feet in thickness. Thick, upward-coarsening and upward-fining log patterns of sand-dominated intervals represent sheet-sand lobe progradation and channel fill/abandonment, respectively, in proximal-fan areas. Irregularly stratified sand successions displaying spiky log patterns suggest deposition in distal-fan areas.

Structural Style

Many of the fields in UM1 F1 are structurally associated with anticlines and salt diapirs—shallow and deep depths—with hydrocarbons trapped on diapir flanks or in sediments draped over diapir tops. Numerous fields are also associated with growth fault anticlines. Less common structures in the play include normal faults, and some fields con-

tain hydrocarbon accumulations trapped by permeability barriers and updip pinchouts or facies changes.

Quantitative Attributes

On the basis of reserves calculations, UM1 F1 is 78% gas and 22% oil. The 77 sands in the play comprise 135 reservoirs, of which 89 are nonassociated gas, 40 are undersaturated oil, and 6 are saturated oil. Proved reserves are estimated at 898.930 Bcfg and 45.714 MMbo (205.666 MMBOE) in 73 sands in 22 fields ([Table 111](#)). Unproved reserves are estimated at 93.492 Bcfg and 4.675 MMbo (21.310 MMBOE) in 4 sands in 1 field. These proved plus unproved reserves account for just over 7% of the reserves for the UM1 Chronozone.

	No. of Sands	Oil (MMbbl)	Gas (Bcf)	BOE (MMbbl)
Proved	73	45.714	898.930	205.666
Cum. production	69	42.300	762.935	178.053
Remaining proved	29	3.414	135.996	27.612
Unproved	4	4.675	93.492	21.310

Table 111. UM1 F1 reserves and cumulative production.

Cumulative production from UM1 F1 totals 762.935 Bcfg and 42.300 MMbo (178.053 MMBOE) from 69 sands in 20 fields. UM1 F1 production accounts for only 8% of the UM1 Chronozone's total production. Remaining proved reserves in the play are 135.996 Bcfg and 3.414 MMbo (27.612 MMBOE) in 29 sands in 17 fields.

[Table 112](#) summarizes that water depths of the fields in UM1 F1 range from 29-348 ft, and play interval discovery depths vary from 6,016-20,110 ft, subsea. Additionally, porosity and water saturation range from 14-33% and 16-58%, respectively.

77 Sands	Min	Mean	Max
Water depth (ft)	29	151	348
Subsea depth (ft)	6,016	13,499	20,110
Reservoirs per sand	1	2	7
Porosity	14%	24%	33%
Water saturation	16%	32%	58%

Table 112. UM1 P1 sand attributes. Values are volume-weighted averages of individual reservoir attributes.

Exploration History

UM1 F1 has a 45-year history of discoveries ([Figure 237](#)). The first sands in the play were dis-

covered in 1954 in the West Delta 58 Field. The maximum number of sands discovered in any year occurred in 1997 with 7 sands from four fields. However, the maximum yearly reserves of 25.899 MMBOE were added in 1991 with the discovery of the largest sand in the play in the Main Pass 252 Field (Figure 238). About 30% of the play's sands have been discovered in the 1990's. In fact, since the first Atlas database cutoff of January 1, 1995, 14 sands have been discovered, the largest of which is estimated to contain 14.961 MMBOE. The mean sand size for the play is 2.948 MMBOE.

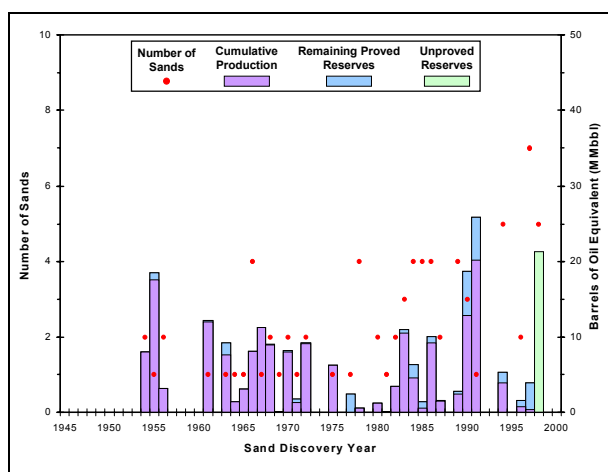


Figure 237. UM1 F1 exploration history graph showing reserves and number of sands discovered by year.

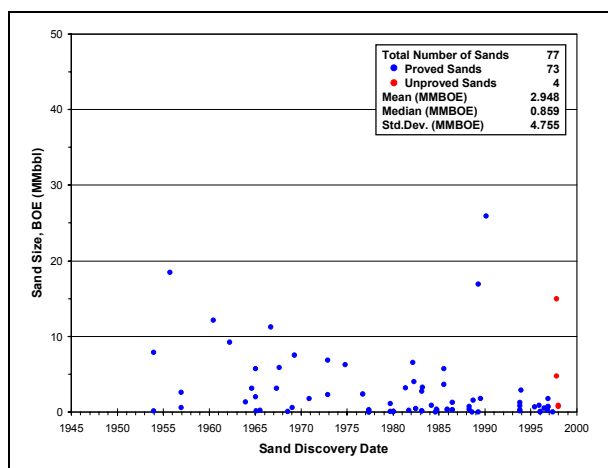


Figure 238. UM1 F1 sand discovery graph showing the size of sands discovered by year.

Production History

UM1 F1 has a 42-year history of production (Figure 239). Oil and gas production began in 1957 and have fluctuated throughout the play's history, both reaching their highest levels in the mid- to late-1990's.

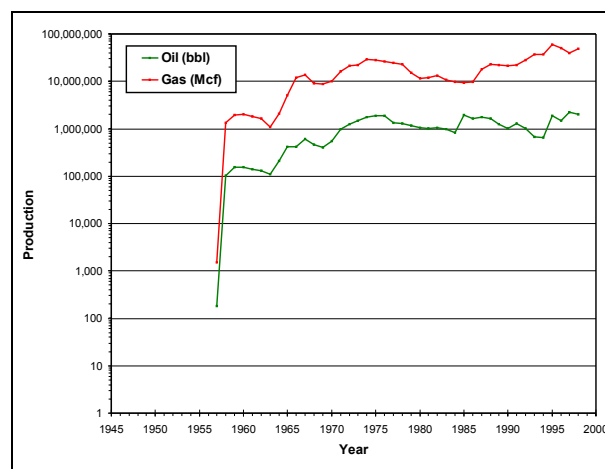


Figure 239. UM1 F1 production graph showing oil and gas production by year.